Red Rock Canyon State Park
Resource Inventory

Overview and Status

January 2003

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Prelude

Red Rock Canyon State Park is located along State Route 14 (SR 14) in Kern County, 26 miles north of Mojave. Topographically, Red Rock Canyon State Park is very complex, consisting of series of tilted sedimentary and volcanic rocks forming ridges and terraces associated with the two principal canyons in the El Paso Mountains, Last Chance Canyon and Red Rock Canyon. Geologic formations composed of lakebed deposits; terrestrial sedimentation, volcanism and massive uplifting define Red Rock Canyon State Park.

In 1994, the California Desert Protection Act (CDPA) was signed into law. The law provides for certain lands within the California Desert Conservation Area to be transferred to the State of California, to become a part of Red Rock Canyon State Park. The intent, as defined in the CDPA, is to provide maximum protection for the specified area's outstanding scenic and scientific values.

Although the language of the CDPA discussed the transfer of 20,500 acres to the State of California, the actual Federal acreage within the defined boundaries amounted to less than that. Following the passage of the CDPA, the Bureau of Land Management (BLM) began the transfer of approximately 17,100acres to the California Department of Parks and Recreation (Department). During this transfer process, which is still on going, a Memorandum of Understanding (MOU) was developed between the two agencies so that land not yet conveyed, or not able to be immediately conveyed due to encumbrance of unpatented mining claims, might be properly managed. The MOU gives the Department management responsibility for all 17,100acres (hereafter referred to as the Last Chance Canyon Addition), regardless of the status of conveyance, with the exception of those mining claims still pertinent.

Including the Last Chance Canyon Addition, Red Rock Canyon State Park encompasses approximately 25,325 acres and includes properties on both sides of SR 14; this includes nearly 19,148 acres of lands owned by the Department with the remaining 6,177 acres managed by the Department under the MOU with the BLM. The Last Chance Canyon Addition more than tripled the size of Red Rock Canyon State Park. BLM properties currently adjoin the park to the north, east and west.

Also following the passage of CDPA, State Parks began conducting field surveys and research for a Resource Inventory document. The purpose of a Resource Inventory is to compile a thorough, accurate, and all-encompassing body of existing information on the natural, cultural, aesthetic and recreational resources of Last Chance Canyon Addition area (Last Chance Canyon Addition) in Red Rock Canyon State Park. This research identifies, records and evaluates Red Rock Canyon's resources in a comprehensive, usable form that is readily available to Department personnel for use in management of the park and is not thought of as a final document. A Resource Inventory document is never viewed as complete, for it is continually revised when new data or information becomes available; therefore, this inventory work is a continuing process.

The Resource Inventory provides a detailed accounting of the desert features that have drawn Native Americans, homesteaders, miners, academic researchers and casual visitors to this landscape for numerous years. It provides the necessary baseline resource data for the amendment of the Red Rock Canyon State Park General Plan. Subsequently, the General Plan Amendment includes management goals and guidelines for the Last Chance Canyon Addition, and serves as a planning document contributing direction to the concepts of facility development, recreation, interpretation and resource management.

The mission of the Department is "*to provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality recreation*". In essence the completion of the Resource Inventory supports the mission by providing park staff with the information to better preserve the special qualities of Red Rock Canyon, to understand the experiences people seek, and to offer greater educational opportunities for all the people of California and beyond.

The Next Phase – General Planning

The next phase in the Department's management strategy involves the preparation of a General Plan Amendment for Red Rock Canyon State Park. A General Plan is the primary management document for units of the State Park System, establishing a park's purpose and management direction for the future. A General Plan was accomplished for the original 8,225 acres of Red Rock Canyon State Park in 1982. A new General Plan Amendment is needed to define and apply management direction to the Last Chance Canyon Addition. This phase will provide a broad management framework for development throughout the Last Chance Canyon Addition, ongoing management, and public use. With invaluable input from the public, it will provide vision, and long-term goals and guidelines. Public involvement occurs throughout the process via two principal mechanisms: public meetings and through the Department's compliance with California Environmental Quality Act (CEQA).

Red Rock Canyon, like all California State Parks, supports a multitude of visitor uses desires, and values. The General Planning process is a holistic approach to park management. It is clearly part of the mandate of the Department to protect the desert environment held in trust within Red Rock Canyon State Park, as well as to make this spectacular environment available to the public for their enjoyment. Through the Resource Inventory data it is clear that many of the highest concentration of present day visitor use and recreation areas of the Last Chance Canyon Addition are also those favored by prehistoric peoples, homesteaders during the early part of this century. These areas, in the heart of the Addition, are near or adjacent to water – a precious resource in the desert – this is also where many of the most sensitive biotic elements occur. Therefore, it is time to work with the public to develop a plan to provide recreational opportunities for the current generation while protecting this spectacular desert for future generations.

Introduction to the Park

Red Rock Canyon State Park, including the Last Chance Canyon Addition, encompasses approximately 25,325 acres and includes areas on both sides of SR 14. Topographically Red Rock Canyon State Park consists of a series of tilted sedimentary layers and volcanic strata forming the ridgelines and terraces that encompass the park's two principal drainages, Last Chance Canyon and Red Rock Canyon.

The topography is mostly steep to very steep, with more level areas limited to the broad desert valleys between buttes and ridges. Slopes vary from flat to slight (0-10%) to very steep (greater than 40%). It is estimated that at least 999 acres of the unit have slopes that exceed 40%; in contrast, only 6,820 acres are estimated to be less than 10 % slopes. Terrain in the Last Chance Canyon Addition ranges from is approximately 1,990 feet to the highest point of 3,708 feet above mean sea level.

There are a number of unique topographic features that comprise this unit. There are the drainages of Last Chance Canyon and Red Rock Canyon, Hagen Canyon with it's sheer colorful cliffs, Scenic Canyon and Nightmare Gulch characterized by a broad wash, and steep nearly sheer cliffs, of the El Paso Mountains. In addition to natural topographical features manmade features include those associated with the Old Dutch Cleanser Mines and Opal Mines.

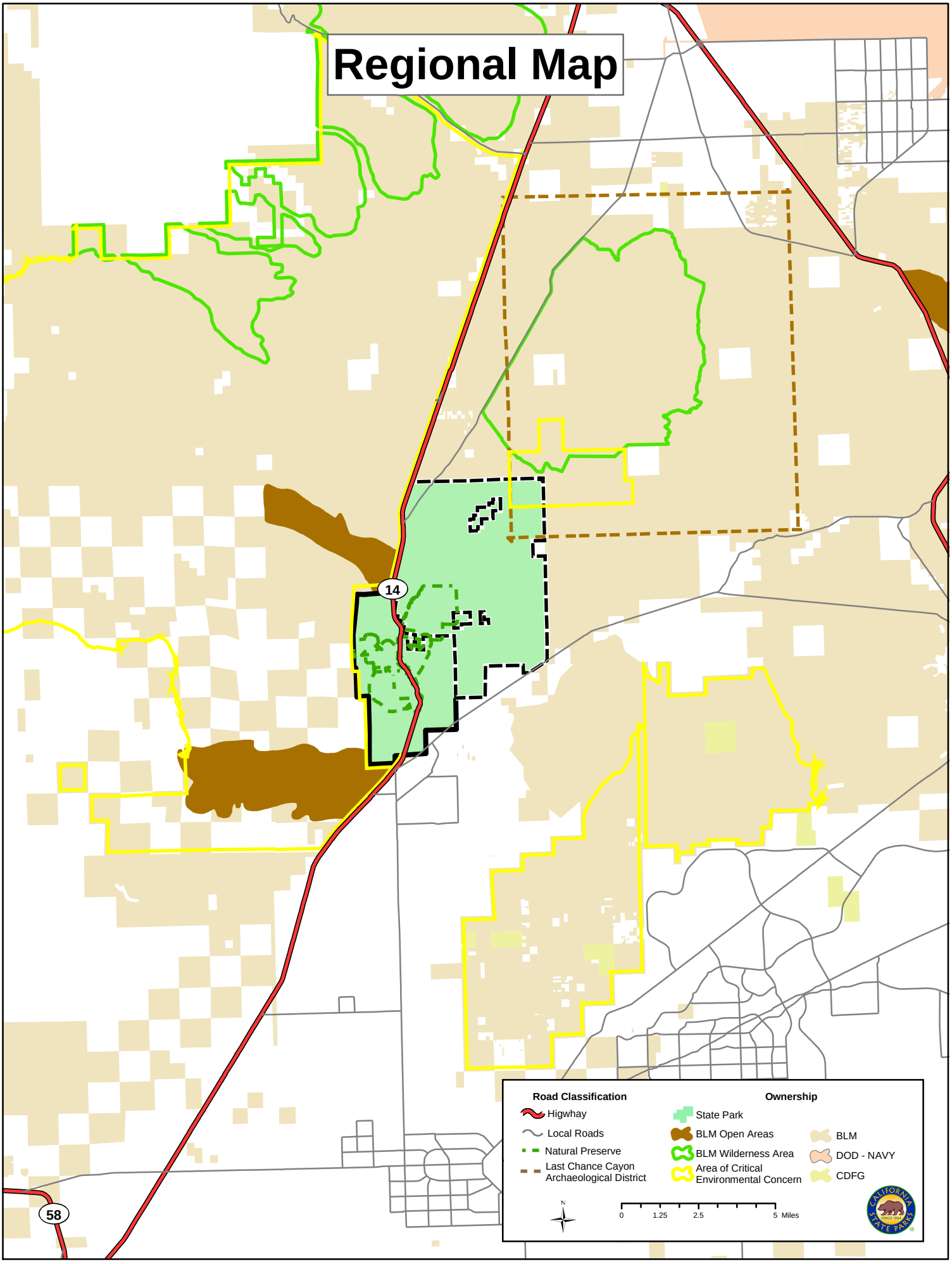
The Last Chance Canyon Addition supports eight vegetation types including a watery oasis in Last Chance Creek, seven sensitive plant species that includes one endemic species, and three wildlife species listed as threatened or endangered under the Federal Endangered Species Act and/or the California Endangered Species Act.

Red Rock Canyon State Park including the Last Chance Canyon Addition encompasses parts of four different ecosystems or ecological units. These include desert riparian, desert scrub, Joshua tree woodland, and barren ecosystems.

The Resource Inventory

Approach to completing the Resource Inventory

Due to the difficult terrain of the Last Chance Canyon Addition, strategies for inventory, data management and presentation of the compiled information were required. The Resource Inventory is compiled and organized by subject matter, written text summary, and Geographic Information System (GIS) data files which display mapped information. The organization of these data in text and digital format increases daily effectiveness when managing resources, including the visiting public, through an increased flow of information enabling improved utilization of park staff. While users of the data are predominately park staff, information gathered and GIS databases developed during this inventory are much sought after and shared with numerous State and Federal agencies as well as with appropriate local jurisdictions, and private individuals and groups.


Regional Map
14
58
Road Classification
Higwhay
Local Roads
Natural Preserve
Last Chance Cayon Archaeological District
Ownership
State Park
BLM Open Areas
BLM Wilderness Area
Area of Critical Environmental Concern
BLM
DOD - NAVY
CDFG
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1.25
2.5
5 Miles

The organization of the resource inventory follows Department protocol with subject chapters as indicated in Table 1.

Table 1. Department of Parks and Recreation Resource Inventory Subject Chapters

Introduction	Text: Purpose of the Resource Inventory, Project and Park Descriptions; Mapping elements: Park boundary with inholdings, Project map – Last Chance Canyon Addition Area.
Topography	Text: Introduction, Regional Setting, General Topographic descriptions, Recommendations: Mapping elements: Topographic base map, Routes of Travel, Slope and Aspect of Addition Area
Meteorology	Text: Introduction, Climate Description, Temperature and Precipitation Tables, Other Atmospheric Phenomena, Climatic Record, Microclimate, Recommendations.
Hydrology	Text: Introduction, Watershed descriptions, Surface Water discussion, Data Tables, Recommendations: Addition Area Watershed Map.
Geology	Text: Lithology, Geologic Structure History discussion, Mineralogy and Geomorphology discussion, Recommendations: Mapping elements: Addition Area Geology
Paleontology	Text: Introduction, Resource Classification and Significance discussion, Survey Personnel and Methodologies, Resource threats, Recommendations; Mapping elements: Location of Resources
Soils	Text: Introduction, Soils Classification, Regional Setting, Factors of Soils Formation, Recommendations; Mapping elements: Addition Area Soils.
Plant Life	Text: Introduction, Floristics, Plant Species tables, Sensitive Plant discussion, Terrestrial Vegetation discussion, Plant Community discussion, Plant Community Crosswalk, Special Interest Plant Community discussion, Exotic Plant discussion, Natural Environmental Fluctuations, Human caused Influences, Resource Threats, Additional work needed, Recommendations; Mapping elements: Sensitive Plant locations, Plant Communities.
Animal Life	Text: Introduction, Wildlife Habitats discussion, Wildlife Habitat Crosswalk, Sensitive Wildlife discussion, Nightmare Gulch/Scenic Canyon Birds of Prey Seasonal Closure, Sensitive Wildlife table, Recommendations; Mapping Elements: Biotic Communities, Sensitive Species locations.
Ecology	Text: Introduction, Ecosystem discussion, Natural Preserves, Recommendations: Mapping Elements: Natural Preserves.
Archeology	Text: Introduction, Background, Survey Reports, Survey Personnel and Methodologies, Survey Results, Resource Threats, Cultural Preserves and Areas of Critical Environmental Concern,

	Recommendations; Mapping Elements: Survey Locations, Resource Locations, Cultural Preserves and ACEC.
History	Text: Introduction, Background, Previous Investigations, History, Oral History Interviews, Catalog of Photos Collection, Recommendations; Mapping Elements: Historic Routes, Historical Site locations
Aesthetics	Text: Introduction, Scenic Resources, Evaluation, Night Sky, Other Aesthetic Resources, Recommendations; Mapping Elements: Scenic Features of the Addition Area, designated Scenic Areas, View sheds.
Recreation	Text: Introduction, Recreation Impacts and Constraints within the Addition Area, Roads and Trails features, Recommendations; Mapping Element: Facilities, Camping, and Backcountry Areas.

The first effort of the inventory process included a systematic assessment of the available information describing park resources, boundaries and legal provisions (mining claims, BLM MOU lands, rights of way) within the Last Chance Canyon Addition. Baseline data were gathered from universities, libraries, and natural and cultural history museums. In addition, specialists were contracted and participated in the sharing of existing information as well as gathering information to fill data gaps. Park staff specialists conducted and continue to conduct focused surveys and gather data throughout the Last Chance Canyon Addition Area.

As a result of the size and scope of the Resource Inventory, the approach included use of digital mapping technologies (GIS mapping). The use of a GIS system allows for both a visual display of the data and for complex analyses of the data that can otherwise be extremely time consuming.

Status of the Inventory

The inventory is a dynamic document that will be continuously updated as park staff work with and refines data, as new information becomes available. The product developed under the current effort provides the foundation for continued data collection while supporting effective management of the park. Some highlights of the information gained through the Resource Inventory are discussed below by chapter as they appear in Table 1.

Highlights of the Inventory

Introduction and Topography:

Topographic descriptions for Red Rock Canyon State Park are derived from field surveys, the U.S. Geological Survey (USGS) Cantil 7.5 minute quadrangle and Saltdale NW 7.5 minute quadrangle, and aerial photos (1:6000 scale). In addition, GIS layers

(coverage's) have been developed that delineate the park and the Last Chance Canyon Addition Area boundaries, roads (paved and primitive) and trails, park facilities, private parcel and mining claims occurring within the Addition Area.

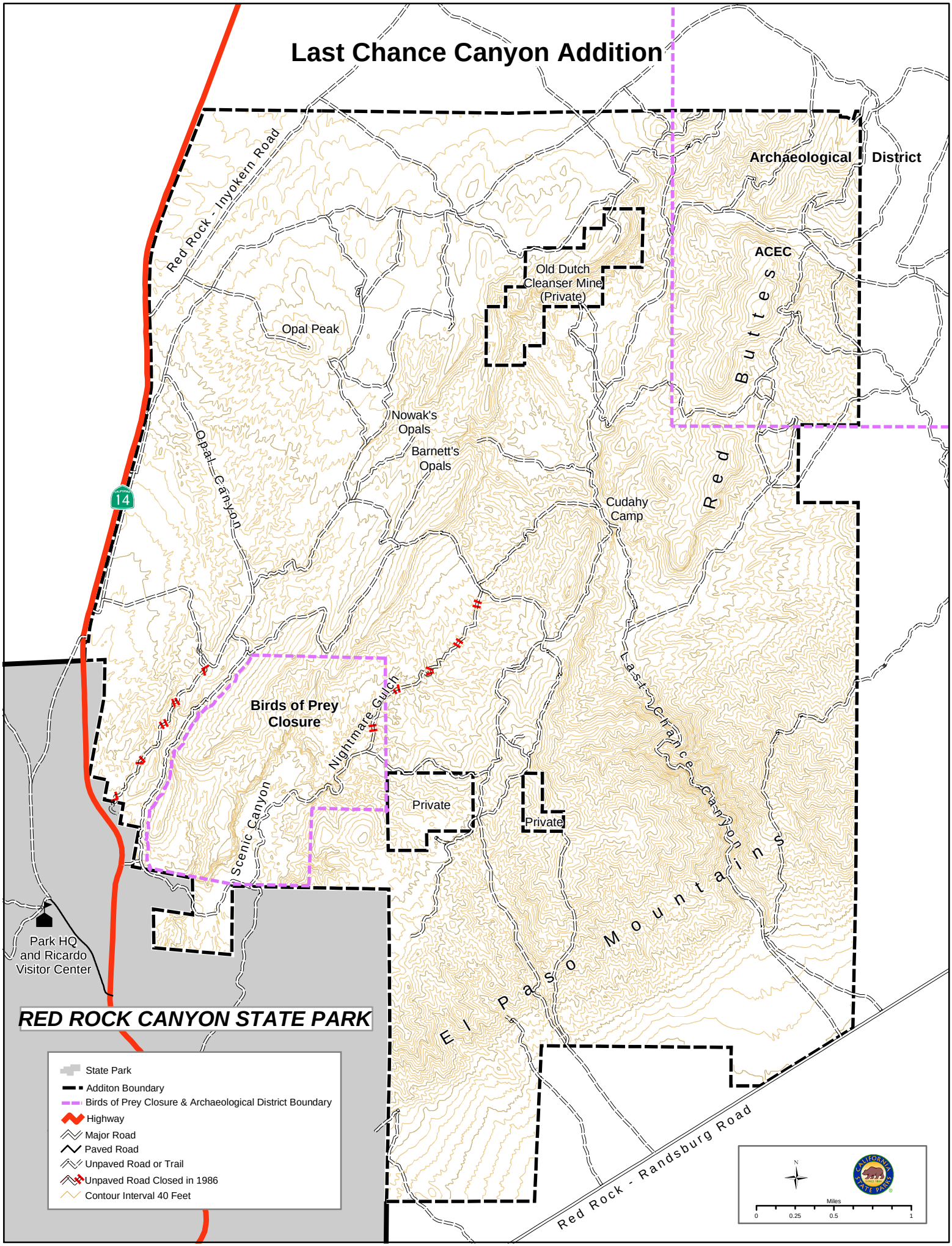
The text provides the reader an introduction to the park, the purposes, and intent and general approach of the inventory effort and an overview of the tremendous resource values contained within the park.

Meteorology:
Data from the Kern County weather reporting stations are located in the town of Mojave at 834 meters in elevation and approximately 25 miles southwest of the unit and at Randsburg at 1088 meters in elevation located approximately 20 miles east of the Ricardo Visitor Center on Abbot Drive. The National Weather Service from 1955 to 1974 used Cantil as a weather recording station. These data were analyzed to provide a summary of climatic factors that affect the park. Parameters investigated include: precipitation, relative humidity, wind, the effect of severe storm events within the park, and air quality. This is the first effort undertaken to gather and analyze climatological data into a concise summary, which provides a context for interpreting the information with a global, regional, local, and microclimatic framework.

Hydrology:
Surface waters including springs, seeps, and watersheds were researched and documented. The analysis included water flow data for surface waters. Numerous sources of water are included in the GIS hydrology data coverage, ranging from perennial streams to nearly year round springs. There are two hydrologic units and three hydrologic areas within Red Rock Canyon State park covering approximately 30,000 acres.

Water is a critical resource and is often a limiting factor for life in desert regions. The knowledge of watersheds, water flow, and water quality are critical in managing many of park resources including rare and endangered species and ensuring water resources for park visitors at the Ricardo Campground.

Geology:
Red Rock Canyon State Park is underlain by a diversity of geologic formations ranging in age from middle Mesozoic (Jurassic Era approximately 120,000 million years) to late Holocene (less than 1000 years). Tectonic processes, most notably uplift along the Garlock and El Paso Faults, have brought these diverse formations to the surface where ongoing weathering and erosion continuously yields new exposures. The geologic resources of Red Rock Canyon are one of the primary or principle attributes that focused human attention on the preservation of local resources, captured in the concept of a publicly owned park.


Last Chance Canyon Addition
Archaeological District
ACEC
Red Rock - Inyokern Road
Old Dutch Cleanser Mine (Private)
Opal Peak
Nowak's Opals
Barnett's Opals
Opal Canyon
Red Buttes
Cudahy Camp
14
Birds of Prey Closure
Nightmare Gulch
Scenic Canyon
Private
Private
Last Chance Canyon
El Paso Mountains
Park HQ and Ricardo Visitor Center
RED ROCK CANYON STATE PARK
Red Rock - Randsburg Road
State Park
Additon Boundary
Birds of Prey Closure & Archaeological District Boundary
Highway
Major Road
Paved Road
Unpaved Road or Trail
Unpaved Road Closed in 1986
Contour Interval 40 Feet
N
Miles
0
0.25
0.5
1

These geologic investigations allow for site-specific detailed analysis in areas of high visitor use. The inventory text describes the dynamic nature of the formations as well as the documenting sensitive resources and potential threats to valued resources within the Last Chance Canyon Addition Area.

Paleontology:
Within the California State Park System, the fossil resources of Red Rock Canyon are second only to those of Anza Borrego Desert State Park. Museum collections contain records of over 800 fossil-producing localities and tens of thousands of fossil specimens. Most notable among the fossil-producing formations is the Miocene-aged (approximately 12.5 to 7.5 million year old) Dove Spring Formation. Fossil assemblages of the Dove Spring Formation have been used as a standard to define the age interval represented by these fossils throughout all of North America.

Scientific research and surveys, particularly within the Dove Spring Formation, have been undertaken by researchers from the University of California at Berkeley, University of California at Riverside, the Natural History Museum of Los Angeles County, and the Webb School of California. Research continues to the present and to date at least 96 species are currently recognized as having inhabited that late Miocene environment.

The resource inventory provides an analysis and discussion of these collections and their significance in a regional as well as global context. The main fossil producing areas of the park are mapped within the GIS database. The opportunity now exists for systematic management and research of paleontology resources within the Addition Area.

Soils:
A soil inventory was compiled from a literature review of two surveys; the U.S. Department of Agriculture Soil Conservation Service (USDA-SCS) Soils of Kern County California Southeastern Part, and a 1995 survey by the Natural Resource Conservation Service (NRCS; Jim Regal and Ed Russel, NRCS Bakersfield office) of the Red Rock Canyon State Park, including the Addition area. The Soil Survey of Kern County California Southeastern Part was produced in cooperation with the University of California Agricultural Experiment Station.

The resource inventory summarizes and discusses each of the soils types found within the Last Chance Canyon Addition Area. These data were analyzed to provide a summary of the soil types found throughout the Addition Area and can be used to direct focused surveys and management in the future.

Plant Life:
This chapter provides information on a broad range of issues relating to plants and the associated communities. The discussion includes the occurrences of individual plant species (rare and sensitive species), distributions of plant communities, and the effects of environmental factors (soil affinities, slope/aspect, and climate) in limiting plant occurrences and growth. The Last Chance Addition area supports eight vegetation types.

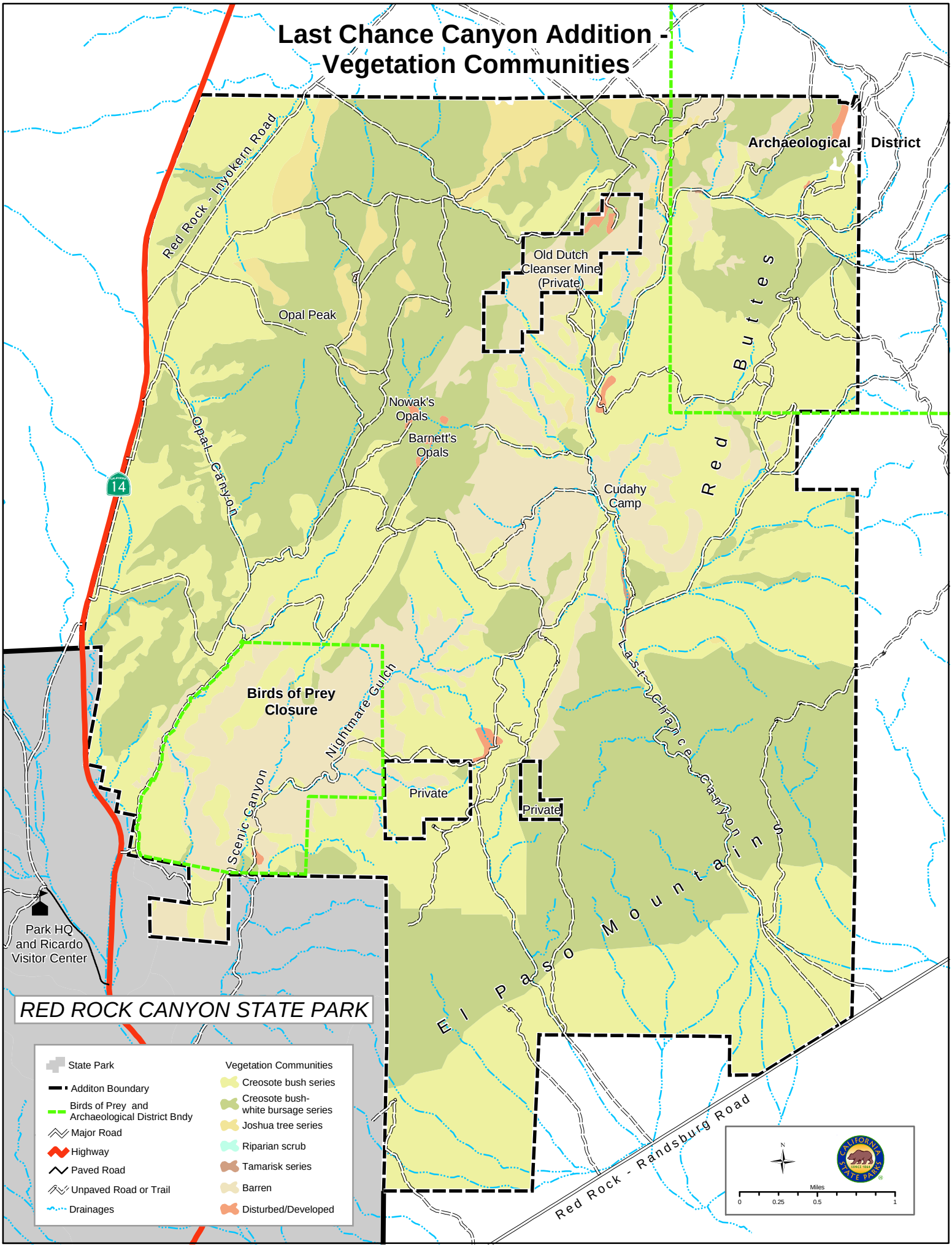
A detailed analysis of vegetation patterns and descriptions, as well as mapping of the vegetation communities within the Last Chance Canyon Addition Area is also discussed. A vegetation map was developed as a GIS coverage and is therefore usable in many management functions.

Focused rare plant surveys have been conducted by park staff over many seasons, which have documented at least seven sensitive plant species within the Last Chance Canyon Addition and throughout Red Rock Canyon State Park. In addition, another 10 sensitive plant species have the potential of occurring within the boundaries of the site, based on distribution and habitat affinities. Some of the rare plants found within the Addition Area are found nowhere else. Knowledge of rare and endangered plant populations is critical for the management of these valued resources.

The remainder of the chapter discusses the overall floristics of the Addition Area within the context of the greater western Mojave Desert. As additional information and focused surveys are conducted additional mapping may result from the analysis of this information.

Animal Life:
This chapter discusses data gathered from park staff and specialists, as well as volunteers who have been recording wildlife observations for many years. Focused surveys have been conducted for the three listed species that occur in Red Rock Canyon State Park, including the Last Chance Canyon Addition Area. Additional data was compiled through various sources including academic institutions, museums and professional specialists. The habitat affinities and known occurrences were documented and summarized in text and mapped with the GIS database. Many experts continue to collect and analyze data within the park and as a result additional mapping may result from the analysis of this information.

Ecology:
This section utilizes text from the other biotic sections of the inventory to summarize ecological relationships and through text, more fully discuss the complex relationships of the natural resources of the Additional Area. The ecology section in intended to tie information from the previous section together and show the interrelationships among biotic and physical features by focusing on natural processes rather than one separate species or physical element. No original research specific to this section is required.


Last Chance Canyon Addition - Vegetation Communities
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RED ROCK CANYON STATE PARK
Red Rock - Randsburg Road
State Park
Additon Boundary
Birds of Prey and Archaeological District Bndy
Major Road
Highway
Paved Road
Unpaved Road or Trail
Drainages
Vegetation Communities
Creosote bush series
Creosote bush-white bursage series
Joshua tree series
Riparian scrub
Tamarisk series
Barren
Disturbed/Developed
N
Miles
0
0.25
0.5
1

Archaeology:
Systematic archaeological field investigations were first conducted within the Last Chance Canyon Addition in the early 1960s. BLM Archaeologists conducted limited fieldwork in the Addition in the 1970s and 1980s. California State Parks Archaeologists have been studying archaeological sites within the Addition from 1995 up to present-day. The latter studies have resulted in the recordation of 76 archaeological sites; several more known prehistoric sites and historic properties remain to be formally recorded. The archaeological work performed within the parkland follows recognized professional standards. The archaeological fieldwork conducted thus far represents a good sample of the potential cultural remains within the Last Chance Canyon Addition. The northeastern end of the Addition holds a portion of the Last Chance Canyon Archaeological District, a National Register of Historic Places property. This National Register District was created by BLM staff in the early 1970s to recognize the extraordinary density and cultural values of archaeological sites in the area.

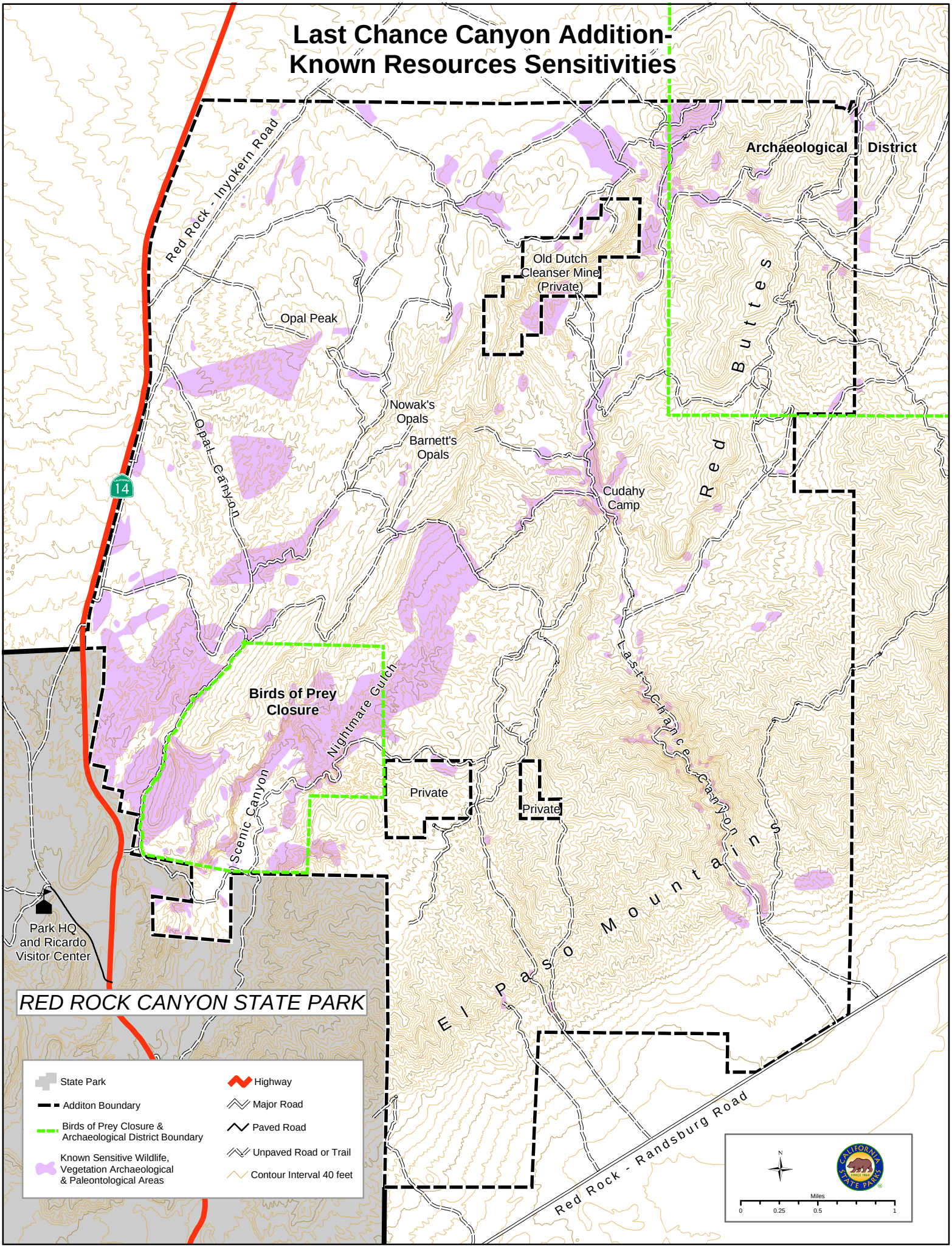
The types of prehistoric archaeological sites found in the Addition include the following: chert quarries (sources of stone used for toolmaking), stone artifact scatters, lithic prospects (where naturally occurring stone was tested for its quality), occupation locations (camps used on a seasonal basis), small special-purpose camps (e.g., used to obtain plant foods or animals, etc.), rock art locations, and ceremonial locations. The Last Chance Canyon Addition is noteworthy for large stone quarry areas and stone-tool manufacturing locations. Stone, in particular, cherts and chalcedonies, was obtained by prehistoric toolmakers and carried away for future uses. The types of historic-period archaeological sites within the Addition include the following: dry placer gold mines, mines created for industrial products (e.g., clays and pumice), work camps associated with the industrial mines, abandoned modern-day gold mines, camp sites associated with early 20th century tourism, and other potential sites. The archaeological sites in the Addition hold strong potential to answer important scientific research questions related to regional prehistory and history. Information obtained from recent archaeological investigations is already being employed in park interpretive programs.

History:
Although the Departments administration of Red Rock Canyon SP and the Last Chance Canyon Acquisition only dates back to 1969 and 1994, respectively, the park has witnessed various overlapping historical trends and events. This section is an overview of these events that have either directly or indirectly affected the Park's historical landscape. It contains information gleaned from previous and ongoing historical and archaeological research, study and evaluation. The history of the park's past and current use is the story of the dynamic and often conflicting relationship between natural resource exploitation, recreation, and the protection of the desert's fragile ecosystem. In addition to providing a historical summary, the historic section suggests several important themes that may help to organize the Red Rock/Last Chance Canyon Addition's historical development. A theme is considered significant if it can be demonstrated, through scholarly research, to be important in American history. They assist in organizing the past into coherent patterns based on exploration and settlement, transportation,

mining technology, recreation, resource protection, etc., that have influenced the land's development for the past 154 years. Historic themes play an integral role in evaluating potential historic resources regarding their historic significance and eligibility for placement on the California and National Registers.

Aesthetics:
This chapter includes an analysis of the areas within the park that are of special interest to park visitors, including scenic vistas, Last Chance Canyon and it's steep rocky walls and spring oasis, geologic features or paleontologic material projecting from the Dove Spring Formation and from the local exposure of ancient stream and lake sediments, and night sky viewing. The research conducted in an aesthetic inventory includes an analysis of historical values assigned to park areas as well as areas appreciated by park visitors today. As such, it is closely tied with the Recreation Resources chapter below. An aesthetic analysis examines people's views of the desert environment, the unique feelings the visitor experiences, and the wildness that one seeks that is such an important component of the desert environment.

Recreation Resources:
The recreational resources portion of the inventory includes an assessment of the types of visitor experiences sought and available within the park. Recreational uses of the park both past and present are inventoried and documented. This chapter overlaps with many of the others including, the historical and aesthetic investigations; however, it goes beyond a qualitative analysis and includes an evaluation of visitor statistics, facilities, and identification of features that specifically attract visitors including the annual wildflower bloom, road access for scenic touring, and backcountry wilderness experiences. This chapter examines the distribution of information to park visitors, park visitor demographics, and potential user conflicts. The recreation discussion becomes an essential part of park planning as resources preservation is balanced with providing high quality visitor opportunities.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CONCLUSION

The completion of the resource inventory of Red Rock Canyon State Park Last Chance Canyon Addition Area is the culmination of intense effort by a number of people. The staff have dedicated themselves to bringing together this vast amount of information including, literature reviews, GIS mapping, field collected data, aerial photographs, historical accounts and cultural history. The end product is a platform upon which all future studies will be based and the format is such that revisions ad updates can be easily integrated.

This Resource Inventory Overview
was prepared by
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Southern Service Center

The Resource Inventory
was compiled by
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